

WHAT IS CLAIMED IS:

1. A method for information filtering in a computer system receiving a data stream from a computer network, the data stream having raw informons embedded therein, at least one of the raw informons being of interest to a user, the user being a member client of a community, the method comprising the steps of:

- a. providing a dynamic informon characterization having a plurality of profiles encoded therein, the plurality of profiles including an adaptive content profile and an adaptive collaboration profile;
- b. adaptively filtering the raw informons responsive to the dynamic informon characterization, producing a proposed informon thereby;
- c. presenting the proposed informon to the user;
- d. receiving a feedback profile from the user, responsive to the proposed informon;
- e. adapting at least one of the adaptive content profile and the adaptive collaboration profile responsive to the feedback profile; and
- f. updating the dynamic informon characterization responsive to the adapting of step (e).

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2. The method of Claim 1 wherein the step of adaptively filtering is distributed.

3. The method of Claim 2 wherein the step of distributed adaptively filtering includes community filtering and client filtering, thereby respectively producing a community profile and a member client profile, each of the community filtering and client filtering being responsive to the adaptive content profile and the adaptive collaboration profile, the dynamic informon characterization being adapted responsive to at least one of the community profile and the member client profile.

4. The method of Claim 3 wherein the user profile includes at least one member client profile.

5. The method of Claim 1 having a plurality of communities and a plurality of users, a plurality of clients being representative of each user, each client being a member client of a selected one of the plurality of communities and having a member client profile.

6. The method of Claim 5 wherein the step of adaptively filtering is distributed and includes the steps of:

- a. community filtering the informons responsive to the adaptive content profile and the adaptive collaboration profile;
- b. producing a community profile for at least one of the communities, the community profile being representative of the respective community norms;
- c. client filtering the informons responsive to the adaptive content profile and the adaptive collaboration profile; and
- d. producing member client profiles for selected member clients in respective communities, the member client profiles being representative of respective member client preferences; and
- e. adapting the dynamic informon characterization responsive to a selected community profiles and the member client profile.

7. The method of Claim 1 wherein:

- a. the feedback profile includes a plurality of user responses to the proposed informon; and
- b. the step of updating the dynamic informon characterization further includes the step of predicting selected subsequent ones of the plurality of user responses.

8. The method of claim 6 wherein:
 - a. the feedback profile includes a plurality of member client responses to the proposed informon; and
 - b. the step of updating the dynamic informon characterization further includes the step of predicting selected subsequent ones of the plurality of member client responses.
9. The method of Claim 1 further comprising the steps of:
 - a. credibility filtering the informons responsive to an adaptive credibility profile; and
 - b. updating the credibility profile responsive to the feedback profile.
10. The method of Claim 8 further comprising the steps of:
 - a. credibility filtering informons responsive to an adaptive credibility profile; and
 - b. updating the credibility profile responsive to selected member client responses.
11. The method of Claim 10 wherein the step of updating the credibility profile further includes the step

of predicting selected subsequent ones of the plurality of user responses.

12. The method of Claim 1 wherein the step of adapting at least one of the adaptive content profile and the adaptive collaboration profile responsive to the feedback profile further includes the step of optimally adapting the adaptive content profile and the adaptive collaboration profiles.

13. The method of Claim 12 wherein the step of optimally adapting further includes the step of self-optimizing the adaptive content profile and the collaboration profile using a selected self-optimizing technique.

14. The method of Claim 6 wherein the step of adapting at least one of the adaptive content profile and the adaptive collaboration profile responsive to the feedback profile further includes the step of optimally adapting the adaptive content profile and the adaptive collaboration profile.

15. The method of Claim 14 wherein the step of optimally adapting further includes the step of self-

optimizing the adaptive content profile and the adaptive collaboration profile using a selected self-optimizing technique.

16. The method of Claim 1 wherein each of the informons includes at least one of a textual, a visual, an audio, a patterned data, and a multimedia entity.

17. The method of Claim 6 wherein each of the informons includes at least one of a textual, a visual, an audio, a patterned data, and a multimedia entity.

18. The method of Claim 3 further comprising the steps of:

- a. credibility filtering the informons responsive to an adaptive credibility profile, the credibility filtering being distributed; and
- b. updating the dynamic informon characterization responsive to at least one of the adaptive content profile, the adaptive collaboration profile, and the adaptive credibility profile.

19. The method of Claim 1 further comprising the step of creating a consumer profile responsive to the feedback profile, the consumer profile being representative of

predetermined consumer preference criteria relative to communities of which the user is a member client.

20. The method of Claim 1 wherein the user is one of a plurality of users, each user being a plurality of member clients, each member client being a member of a selected community and having a unique member client profile relative to the selected community, selected member clients of each of the plurality of users being grouped into preselected interest groups, responsive to the respective feedback profiles, and the adaptive collaborative profile being updated responsive to the respective feedback profiles of selected users.

21. The method of Claim 20 wherein the interest groups are representative of user interests and community norms.

22. The method of Claim 1 wherein the user provides a temporally-spaced plurality of feedback responses and the adaptive content profile is adapted therewith according to a preselected adaptation technique.

23. The method of Claim 9 wherein the user is one of a plurality of users, each user being a plurality of member clients, each member client uniquely corresponding with one

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of a plurality of communities and providing a respective feedback profile, selected ones of the plurality of client members being grouped into preselected interest groups responsive to the respective feedback profiles, and the adaptive credibility profile being updated responsive to the respective feedback profiles of the selected ones.

24. The method of Claim 19 wherein the user is one of a plurality of users and the consumer profile is one of a plurality of consumer profiles, and further comprising the step of grouping selected ones of the plurality of users into a preference cohort responsive to the preselected consumer preference criteria.

25. The method of Claim 24 further comprising the step of providing a targeted informon to the preference cohort, the targeted informon corresponding to the predetermined consumer preference criteria relative to the preference cohort.

26. The method of Claim 3 wherein the dynamic informon characterization includes a prefiltering profile, an adaptive broker filtering profile, and a member client profile, and wherein the step of adaptively filtering includes the steps of:

- a. prefiltering the data stream according to the prefiltering profile, thereby extracting a plurality of raw informons from the data stream, the prefiltering profile being responsive to the adaptive content profile;
- b. filtering the raw informons according to the adaptive broker profile, the adaptive broker profile including the adaptive collaborative profile and the adaptive content profile; and
- c. client user filtering the raw informons according to an adaptive member client profile, thereby extracting the proposed informon.

27. The method of Claim 1 wherein the dynamic informon characterization includes prediction rules and category rules, the prediction rules and the category rules being responsive to the feedback profile.

28. The method of Claim 27 further comprising the step of learning the category rules using a preselected category rule learning technique.

29. The method of Claim 27 further comprising the step of learning the prediction rule using a preselected prediction rule learning technique.

30. The method of Claim 1 wherein the step of providing the dynamic informon characterization includes generating the characterization using a preselected learning technique.

31. The method of Claim 30 wherein the preselected learning technique includes at least one of a top-keyword-selection learning technique, a nearest-neighbor learning technique, a term-weighting learning technique, a neural net learning technique, and a probabilistic learning technique.

32. The method of Claim 31 wherein the term-weighting learning technique is a TF-IDF technique and the probabilistic learning technique is a minimum description length technique.

33. The method of Claim 28 wherein the category rules include a plurality of category profile attributes, and each informon has a plurality of informon category attributes corresponding to respective ones of the plurality of category profile attributes, the category profile attributes being responsive to the user feedback profile, the method further comprising the steps of:

- a. deriving a figure-of-merit for each of the informon category attributes relative to the category profile attributes;
- b. combining the figures-of-merit using a predetermined adaptive function, thereby producing a category fitness figure-of-merit; and
- c. incorporating the category fitness figure-of-merit into the dynamic informon characterization.

34. The method of Claim 33 wherein:

- a. the plurality of informon attributes each include at least one of an informon keyword, a fixed informon representation, informon author, actual and predicted informon destinations, and informon feature values; and
- b. the plurality of category profile attributes each include at least one of category keyword, category fixed representation, ranked category authors, category destination, recent relevant subjects, and category feature values.

35. A method for information filtering in a computer system receiving a data stream from a computer network having a plurality of users, the data stream having raw

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informons embedded therein, the method comprising the steps of:

- a. partitioning each user into a plurality of member clients, each member client having a unique member client profile, each profile having a plurality of client attributes;
- b. grouping member clients to form a plurality of communities, each community including selected clients of the plurality of member clients, selected client attributes of ones of the selected clients being comparable to others of the selected clients thereby providing each community with a community profile having common client attributes;
- c. predicting at least one community profile for each community using first prediction criteria;
- d. predicting at least one member client profile for the client in a community using second prediction criteria;
- e. extracting the raw informons from the data stream, each of the raw informons having an informon content;
- f. selecting proposed informons from the raw informons, the proposed informons being correlated with at least one of the common client attributes and the member client attributes;

- g. providing the proposed informons to the user;
- h. receiving user feedback in response to the proposed informons; and
- i. updating at least one of the first and second prediction criteria responsive to the user feedback.

36. The method of Claim 35 wherein the step of extracting the raw informons further comprises prefiltering the data stream using the predicted community profile, the predicted community profile identifying the raw informons in the data stream.

37. The method of Claim 35 wherein the step of selecting includes the steps of:

- a. filtering the raw informons using an adaptive content filter responsive to the informon content;
- b. filtering the raw informons using an adaptive collaboration filter responsive to the common client attributes for the respective community; and
- c. filtering the raw informons using an adaptive member client filter responsive to the unique member client profile,

wherein the proposed informons are selected from the raw informons thereby.

38. The method of Claim 35 wherein the step of updating at least one of the first and second prediction criteria further includes updating using an optimizing adaptation technique.

39. The method of Claim 38 wherein the optimizing adaptation technique is a self-optimizing adaptation technique.

40. An information filtering apparatus in a computer system receiving a data stream from a computer network, the data stream having raw informons embedded therein, the apparatus comprising:

- a. extraction means for identifying and extracting the raw informons from the data stream, each of the informons having informon content, at least one of the raw informons being of interest to a user having a user profile, the user being a member of a network community having a community profile, at least a portion of each of the user profile and the community profile creating an

- adaptive collaboration profile, the extracting means being coupled to the computer network;
- b. filter means for adaptively filtering the raw informons responsive to the adaptive collaboration profile and an adaptive content profile and producing a proposed informon thereby, the informon content being filtered according to the adaptive content profile, the filter means being coupled with the extraction means;
- c. communication means for conveying the proposed informon to the user and receiving a feedback response therefrom, the feedback response corresponding to a feedback profile, the communication means being coupled with the filter means;
- d. first adaptation means for adapting at least one of the collaboration profile and the content profile responsive to the feedback profile, the first adaptation means being coupled to the filter means; and
- e. computer storage means for storing the adaptive collaborative profile and the adaptive content profile, the storage means being coupled to the filter means.

41. The apparatus of Claim 40 wherein the first adaptation means further comprises second adaptation means for adapting at least one of the user profile responsive to at least one of the community profile and the adaptive content profile, and the community profile responsive to at least one of the user profile and the content profile, and the content profile responsive to at least one of the user profile and the community profile.

42. The apparatus of Claim 40 wherein the first adaptation means includes a prediction means for predicting a response of the user to a proposed informon, the prediction means receiving a plurality of temporally-spaced feedback profiles and predicting at least a portion of a future one of the adaptive collaboration profile and the adaptive content profile in response thereto.

43. The apparatus of Claim 42 wherein the prediction means is a self-optimizing prediction means using a preselected learning technique.

44. The apparatus of Claim 43 wherein the learning technique includes at least one of a top-key-word-selection learning technique, a nearest-neighbor learning technique, a

term-weighting learning technique, and a probabilistic learning technique.

45. The apparatus of Claim 43 further comprising a neural network and the preselected learning technique is a preselected neural network learning technique.

46. The apparatus of Claim 44 further comprising a neural network and the preselected learning technique also includes a preselected neural network learning technique.

47. The apparatus of Claim 40 wherein the filter means further filters the raw informon according to a credibility profile, the credibility profile being responsive to at least one of the adaptive collaboration profile and the adaptive content profile.

48. The apparatus of claim 40 wherein the computer network includes a plurality of network communities coupled with the extraction means, each network community having a plurality of users, each user corresponding to a plurality of member clients, and wherein apparatus further includes:

- a. computer storage for the adaptive collaboration profile and the adaptive content profile for each of the plurality of network communities;

- b. computer storage for the community profile for each of the plurality of communities and the member client profile for each of the plurality of member clients, each member client being coupled to a respective community; and
- c. a plurality of adaptive filters in the filter means for each of the adaptive collaboration and adaptive content and community and member client profiles, each of the adaptive filters being responsive to a respective one of the profiles.

49. The apparatus of Claim 48 wherein selected ones of the plurality of adaptive filters are self-optimizing adaptive filters.

50. The apparatus of Claim 49 wherein each of the self-optimizing adaptive filters use a respective preselected adaptation technique.

51. The apparatus of Claim 50 wherein the respective preselected adaptation technique includes at least one of a top-key-word-selection learning technique, a nearest-neighbor learning technique, a term-weighting learning technique, and a probabilistic learning technique.

52. The apparatus of Claim 50 further comprising a neural network and the respective preselected adaptation technique is a preselected neural network learning technique.

53. The apparatus of Claim 51 further comprising a neural network and the respective preselected adaptation technique including a preselected neural network learning technique.

54. The apparatus of Claim 48 wherein the filter means further includes an adaptive credibility filter for filtering the raw informon according to a credibility profile, the credibility profile being responsive to at least one of the adaptive collaboration profile and the adaptive content profile, and the apparatus further includes computer storage for the credibility profile.

55. An information filtering apparatus in a computer system receiving a data stream from a computer network, the data stream having raw informons embedded therein, the apparatus comprising:

- a. a first processor coupled to the computer network and receiving the data stream therefrom, the first

- processor extracting raw informons from the data stream, responsive to a preprocessing profile;
- b. a second processor coupled to the first processor and receiving the raw informons therefrom, the second processor extracting proposed community informons from the raw informons, responsive to an a community profile;
 - c. a third processor coupled to the second processor and receiving the proposed community informons therefrom, the third processor extracting proposed member client informons from the proposed community informons, responsive to a member client profile;
 - d. a fourth processor coupled to the first, the second, and the third processor, the fourth processor
 - (1) being in communication with the member client,
 - (2) receiving a member client feedback profile responsive to the proposed member client informon,
 - (3) adapting at least one of the adaptive content profile and the adaptive collaboration profile responsive to the member client feedback profile, and

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- (4) updating at least one of the preprocessing profile, the community profile, and the member client profile responsive to the responsive to the adapting of the adaptive content profile and the adaptive collaboration profile.
56. The apparatus of Claim 55, further comprising:
- a. computer storage for the adaptive collaboration profile and the adaptive content profile for each of a plurality of communities;
 - b. computer storage for the community profile for each of the plurality of communities and the member client profile for each of the plurality of member clients, each member client being coupled to a respective community; and
 - c. a plurality of adaptive filters in the filter means for each of the adaptive collaboration and adaptive content and community and member client profiles, each of the adaptive filters being responsive to a respective one of the profiles.

57. The apparatus of Claim 56 wherein the fourth processor further includes an adaptive credibility filter for filtering the raw informon according to an adaptive credibility profile, and wherein the step of updating includes updating the adaptive credibility profile responsive to at least one of the adaptive collaboration profile and the adaptive content profile, and the apparatus further includes computer storage for the credibility profile.

58. The apparatus of Claim 57 wherein selected ones of the plurality of adaptive filters are self-optimizing adaptive filters using a respective preselected adaptation technique.

59. The apparatus of Claim 58 wherein the respective preselected adaptation technique includes at least one of a top-key-word-selection learning technique, a nearest-neighbor learning technique, a term-weighting learning technique, and a probabilistic learning technique.

60. The apparatus of Claim 58 further comprising a neural network and the respective preselected adaptation technique is a preselected neural network learning technique.

61. The apparatus of Claim 59 further comprising a neural network and the respective preselected adaptation technique including a preselected neural network learning technique.

62. A computer program product having a computer-readable medium having computer program logic recorded thereon for information filtering in the computer system receiving a data stream from a computer network, the data stream having raw informons embedded therein, the raw informons having informon content, the user having a user profile and being a member of a community having a community profile, the computer program product comprising:

- a. means for providing a dynamic informon characterization having a plurality of profiles encoded therein, the plurality of profiles including an adaptive content profile and an adaptive collaboration profile, the adaptive content profile being responsive to the informon content, the adaptive collaboration profile being correlated with the user profile and the community profile;
- b. means for adaptively filtering the raw informons responsive to the dynamic informon

characterization, producing a proposed informon thereby;

- c. means presenting the proposed informon to the user;
- d. means for receiving a feedback profile from the user, responsive to the proposed informon;
- e. means for adapting at least one of the adaptive content profile and the adaptive collaboration profile responsive to the feedback profile; and
- f. means for updating the dynamic informon characterization responsive thereto.

63. The computer program product of Claim 62 wherein the means for adaptively filtering is distributed and includes means for community filtering and means for client filtering, each of the means for community filtering and client filtering being responsive to the adaptive content profile and the adaptive collaboration profile, thereby respectively producing a community profile and a client profile, the dynamic informon characterization being adapted responsive to at least one of the community profile and the member client profile, the community profile being at least partially correlated with the member client profile.

64. The computer program product of Claim 63 further comprising means for communicating with a plurality of users and a plurality of communities, each community having a respective community profile, each user being represented by a plurality of clients, each client being a member client of a selected one of the plurality of communities and having a member client profile.

65. The computer program product of Claim 64 wherein the feedback profile includes a plurality of member client responses to the proposed informon; and further comprising means for updating the dynamic informon characterization further includes means for predicting selected subsequent ones of the plurality of member client responses.

66. The computer program product of Claim 62, further comprising:

- a. means for credibility filtering the informons responsive to an adaptive credibility profile, the credibility filtering being distributed; and
- b. means for updating the dynamic informon characterization responsive to at least one of the adaptive content profile, the adaptive collaboration profile, and the credibility profile.

67. The computer program product of Claim 62 wherein the means for adapting further includes means for self-optimizing the adaptive content profile and the adaptive collaboration profile using a selected self-optimizing technique, and the selected self-optimizing technique includes at least one of a top-key-word-selection learning technique, a nearest-neighbor learning technique, a term-weighting learning technique, a neural network technique, and a probabilistic learning technique.

68. The computer program product of Claim 62 wherein each of the informons includes at least one of a textual, a visual, an audio, a patterned data, and a multimedia entity.

69. The computer program product of Claim 62, further comprising:

- a. means for creating a consumer profile responsive to the feedback profile, the consumer profile being representative of predetermined consumer preference criteria relative to the communities of which the user is a member, wherein the user is one of a plurality of users and the consumer profile is one of a plurality of consumer profiles;

- b. means for grouping selected ones of the plurality of users into a preference cohort responsive to the predetermined consumer preference criteria; and
- c. means for providing a targeted informon to the preference cohort, the targeted informon corresponding to the predetermined consumer preference criteria relative to the preference cohort.

70. A computer program product having a computer-readable medium having computer program logic recorded thereon for information filtering in a computer system receiving a data stream from a computer network having a plurality of users, the data stream having raw informons embedded therein, the computer program product comprising:

- a. means for partitioning each user into a plurality of member clients, each member client having a unique member client profile, each profile having a plurality of client attributes;
- b. means for grouping member clients to form a plurality of communities, each community including selected clients of the plurality of member clients, selected client attributes of ones of the selected clients being comparable to others of the

selected clients thereby providing each community with a community profile having common client attributes;

- c. means for predicting a community profile for each community using first prediction criteria;
- d. means for predicting a member client profile for each member client in a community using second prediction criteria;
- e. means for extracting the raw informons from the data stream, each of the raw informons having an informon content;
- f. means for selecting proposed informons from the raw informons, the proposed informons being correlated with at least one of the common client attributes and the member client attributes;
- g. means for providing the proposed informons to the user;
- h. means for receiving user feedback in response to the proposed informons; and
- i. means for updating at least one of the first and second prediction criteria responsive to the user feedback.

71. A computer program product having a computer-readable medium having computer program logic recorded

thereon for information filtering in a computer system receiving a data stream from a computer network having a plurality of users, the data stream having raw informons embedded therein, the computer program product comprising:

- a. extraction means for identifying and extracting the raw informons from the data stream, each of the informons having informon content, at least one of the raw informons being of interest to a user having a user profile, the user being a member of a network community having a community profile, at least a portion of each of the user profile and the community profile creating an adaptive collaboration profile, the extracting means being coupled to the computer network;
- b. filter means for adaptively filtering the raw informons responsive to the adaptive collaboration profile and an adaptive content profile and producing a proposed informon thereby, the informon content being filtered according to the adaptive content profile, the filter means being coupled with the extraction means;
- c. communication means for conveying the proposed informon to the user and receiving a feedback response therefrom, the feedback response corresponding to a feedback profile, the

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communication means being coupled with the filter means;

- d. first adaptation means for adapting at least one of the collaboration profile and the content profile responsive to the feedback profile, the first adaptation means being coupled to the filter means; and
- e. means for storing the adaptive collaborative profile and the adaptive content profile, the means for storing being coupled to the filter means.

72. The computer program product of Claim 71 wherein the first adaptation means further comprises second adaptation means for adapting at least one of the user profile responsive to at least one of the community profile and the adaptive content profile, and the community profile responsive to at least one of the user profile and the content profile, and the content profile responsive to at least one of the user profile and the community profile.

73. The apparatus of Claim 71 wherein the first adaptation means includes a prediction means for predicting a response of the user to a proposed informon, the prediction means receiving a plurality of temporally-spaced

feedback profiles and predicting at least a portion of a future one of the adaptive collaboration profile and the adaptive content profile in response thereto.

74. The computer program product of Claim 73 wherein the prediction means is a self-optimizing prediction means using a preselected learning technique therefor.

75. The computer program product of Claim 74 wherein the preselected learning technique includes at least one of a top-key-word-selection learning technique, a nearest-neighbor learning technique, a neural network technique, a term-weighting learning technique, and a probabilistic learning technique.

76. The computer program product of Claim 75 wherein the filter means further comprises means for filtering the raw informon according to an adaptive credibility profile, the adaptive credibility profile being responsive to at least one of the adaptive collaboration profile and the adaptive content profile.

77. The method of claim 9 further comprising at least one of the step of recommendation filtering and the step of consultation filtering the raw informon responsive to the

feedback profile and providing a respective adaptive recommendation profile and adaptive consultation profile.

78. The method of claim 11 further comprising at least one of the step of recommendation filtering and the step of consultation filtering the raw informon responsive to the feedback profile and providing a respective adaptive recommendation profile and adaptive consultation profile.

79. The method of claim 18 further comprising at least one of the step of recommendation filtering and the step of consultation filtering the raw informon responsive to the feedback profile and providing a respective adaptive recommendation profile and adaptive consultation profile.

80. The method of claim 26 wherein:

- a. the step of prefiltering includes the step of creating a plurality of mode-invariant concept components for each of the raw informons; and
- b. the step of filtering the raw informons includes the steps of:
 - (1) concept-based indexing of each of the mode-invariant concepts into a collection of indexed informons; and

- (2) creating the community profile from the collection of indexed informons.

81. The method of claim 35 further comprising at least one of the step of recommendation filtering and the step of consultation filtering the raw informon responsive to the feedback profile and providing a respective adaptive recommendation profile and adaptive consultation profile.

82. The apparatus of claim 54 wherein the filter means further comprises at least one of a recommendation filter responsive to an adaptive recommendation profile, and a consultation filter responsive to an adaptive consultation profile, each of the adaptive recommendation profile and the adaptive consultation profile being at least partially responsive to the feedback profile and the adaptive credibility profile.

83. The apparatus of claim 55 wherein:
- a. the first processor further includes means for creating a plurality of mode-invariant concept components from the raw informons;
 - b. the second processor further includes means for concept-based indexing the plurality of mode-

invariant concept components into a collection of indexed informons; and

- c. the second processor further includes means for creating the community profile from the collection of indexed informons.

84. The apparatus of claim 83 wherein the second processor further comprises an interactive distributed plurality of mindpool managers having tiers between the data stream and a plurality of users, the distributed plurality successively extracting selected informons responsive to a respective tier profile, the tier profile being closest to the plurality of users being the respective member client profile, the distributed plurality extracting the proposed informon from the data stream for each respective user thereby.

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